FIG. 1A

PRIOR ART

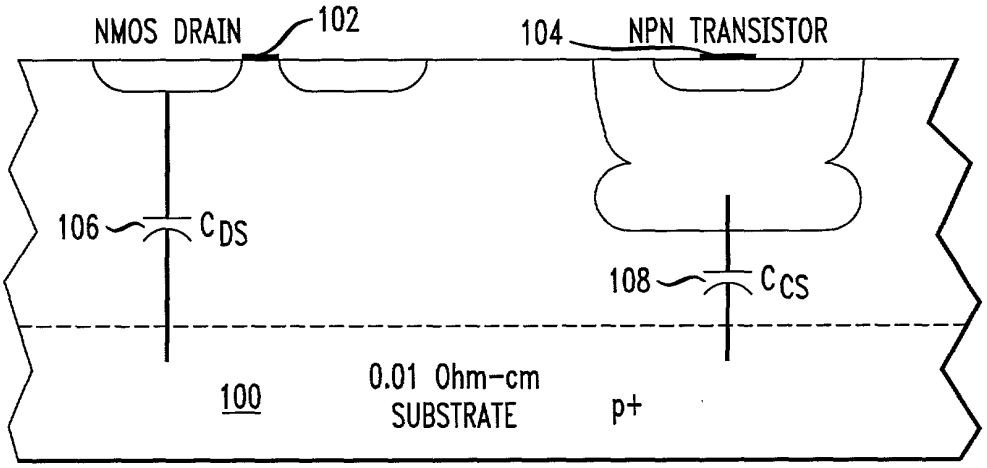


FIG. 1B

PRIOR ART

150

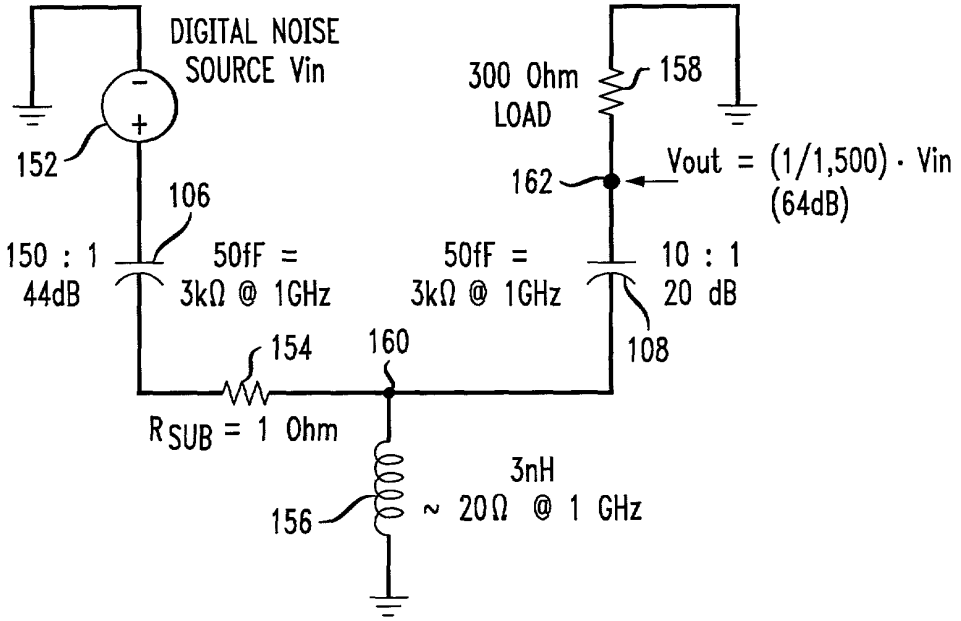


FIG. 2

PRIOR ART

200

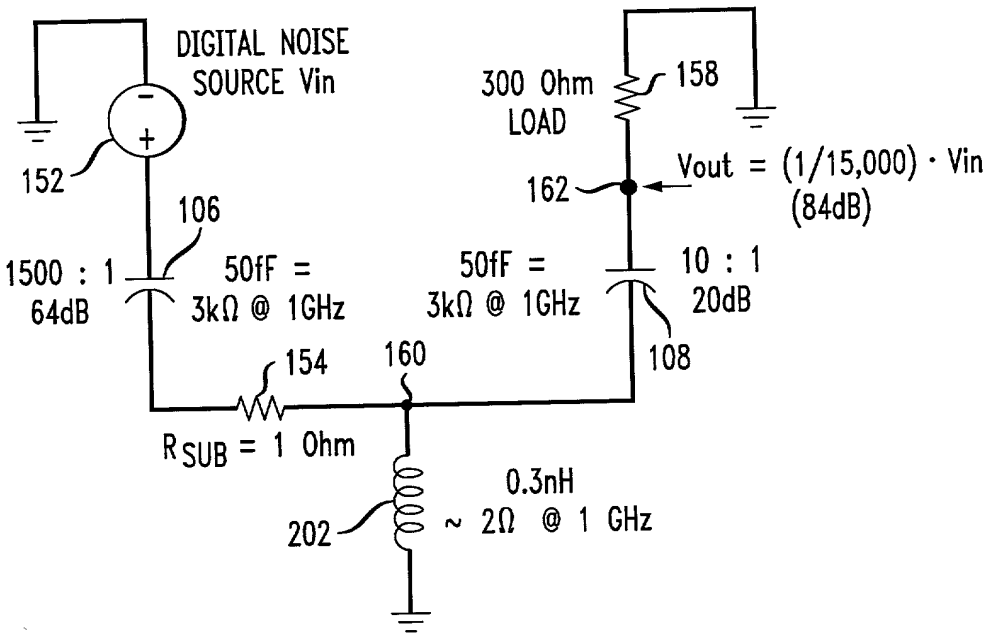


FIG. 3A

PRIOR ART

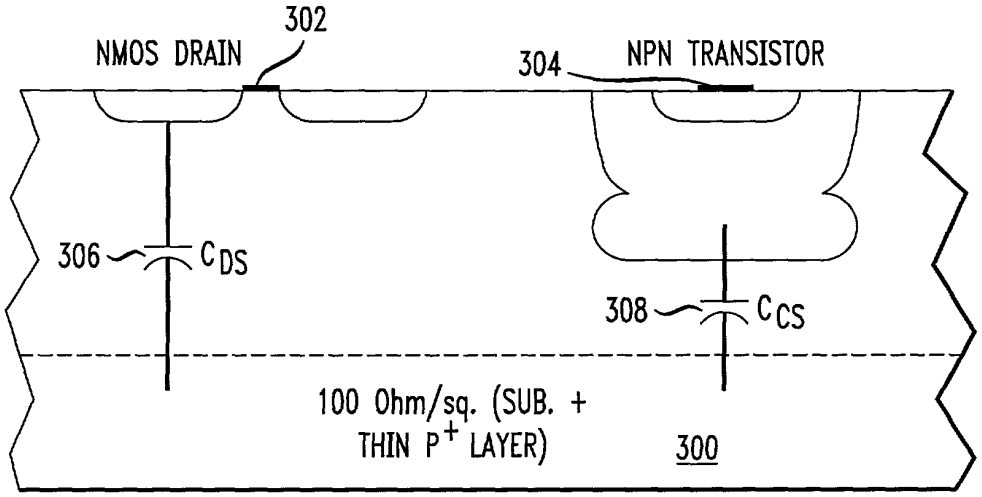


FIG. 3B

PRIOR ART

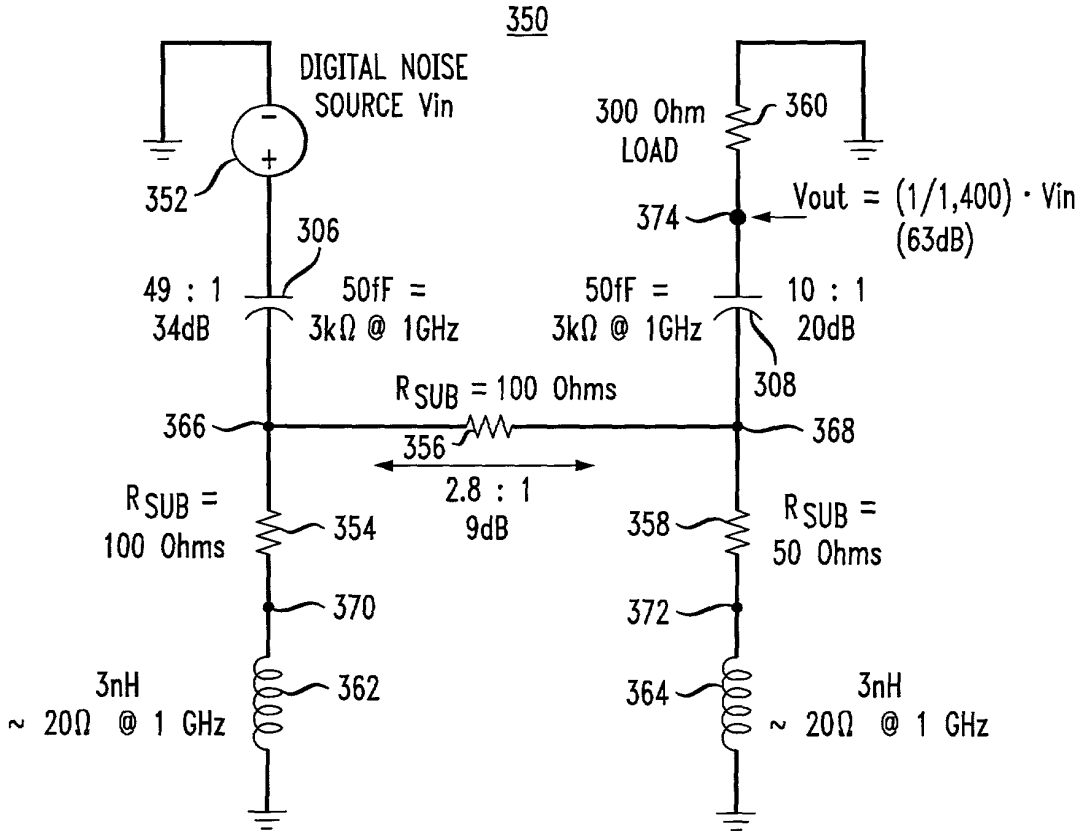


FIG. 4A

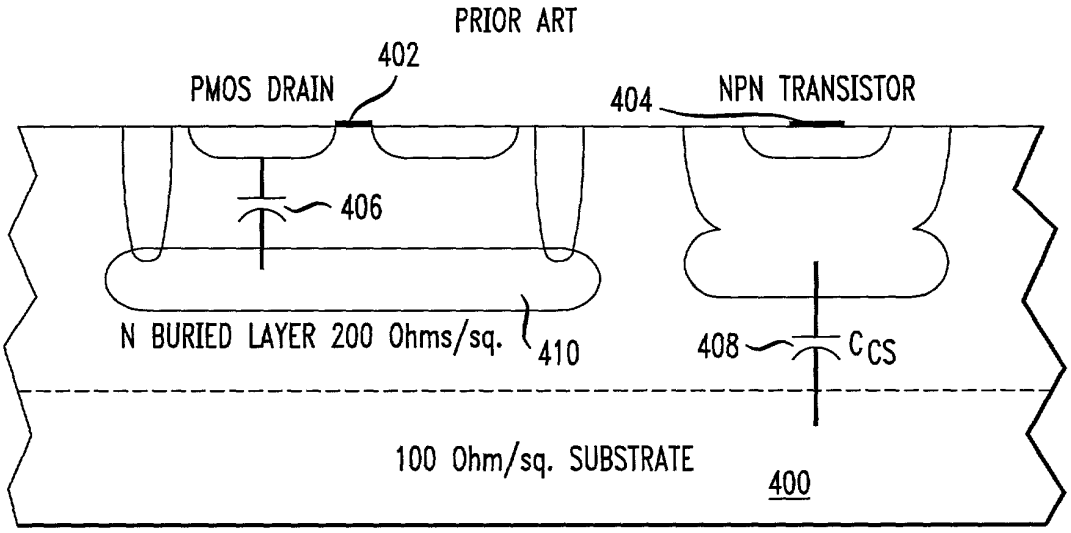

PRIOR ART
PMOS DRAIN
402
404
NPN TRANSISTOR
406
N BURIED LAYER 200 Ohms/sq.
410
408
C_{CS}
100 Ohm/sq. SUBSTRATE
400

FIG. 4B

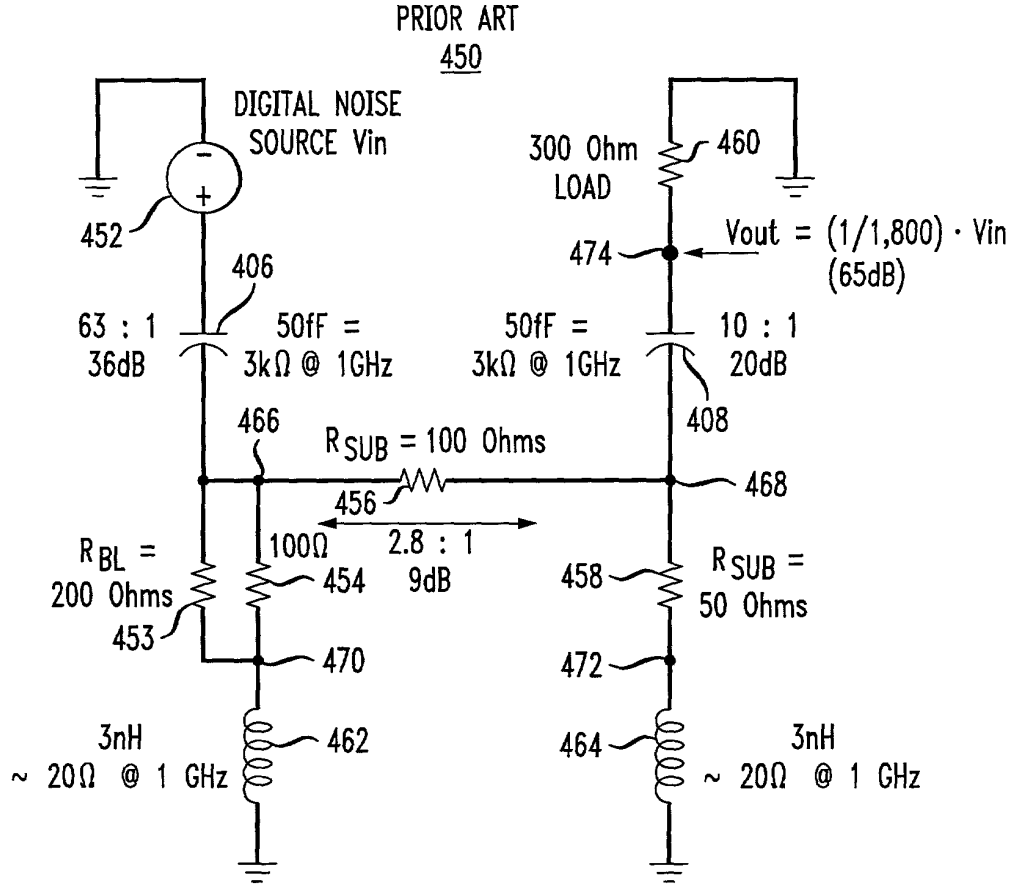

PRIOR ART
450
DIGITAL NOISE SOURCE Vin
452
406
63 : 1
36dB
50fF =
3kΩ @ 1GHz
300 Ohm LOAD
460
Vout = (1/1,800) · Vin
(65dB)
474
50fF =
3kΩ @ 1GHz
10 : 1
20dB
408
466
R_{SUB} = 100 Ohms
456
468
2.8 : 1
9dB
R_{BL} =
200 Ohms
453
100Ω
454
458
R_{SUB} =
50 Ohms
470
472
3nH
~ 20Ω @ 1 GHz
462
464
3nH
~ 20Ω @ 1 GHz

FIG. 5

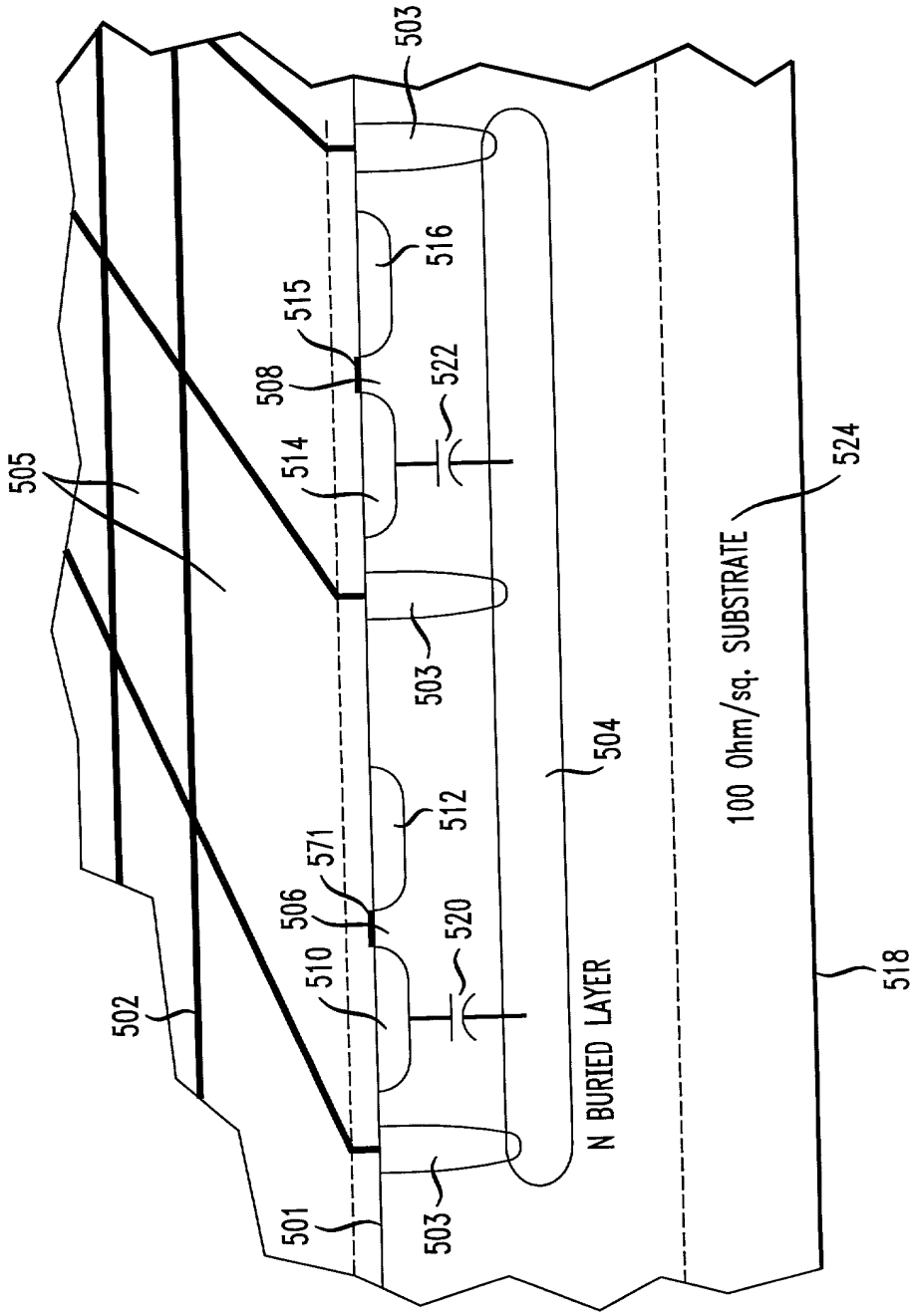

500
503
516
515
508
522
514
505
503
504
512
571
506
520
510
502
N BURIED LAYER
100 Ohm/sq. SUBSTRATE
524
518
501
503

FIG. 6A

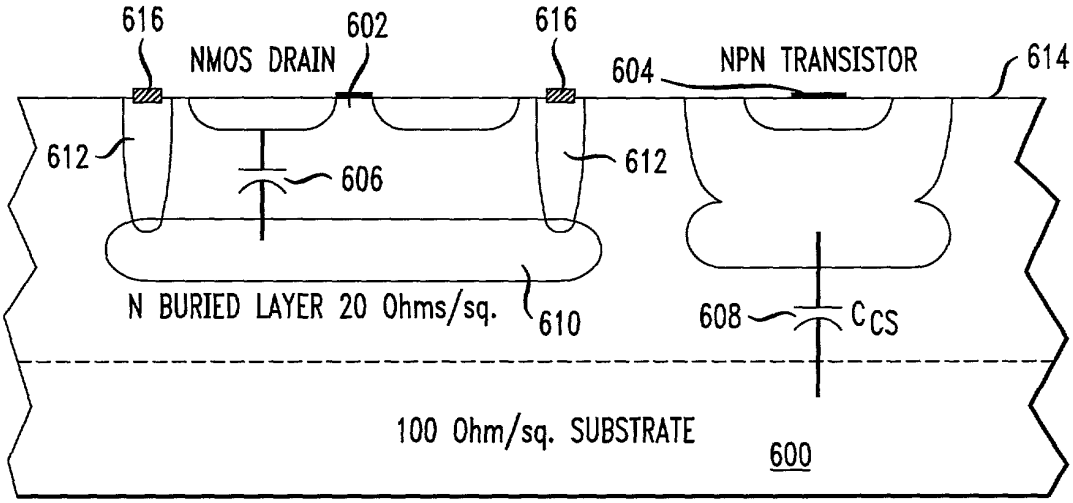

616
NMOS DRAIN
602
616
604
NPN TRANSISTOR
614
612
606
612
N BURIED LAYER 20 Ohms/sq.
610
608
CCS
100 Ohm/sq. SUBSTRATE
600

FIG. 6B

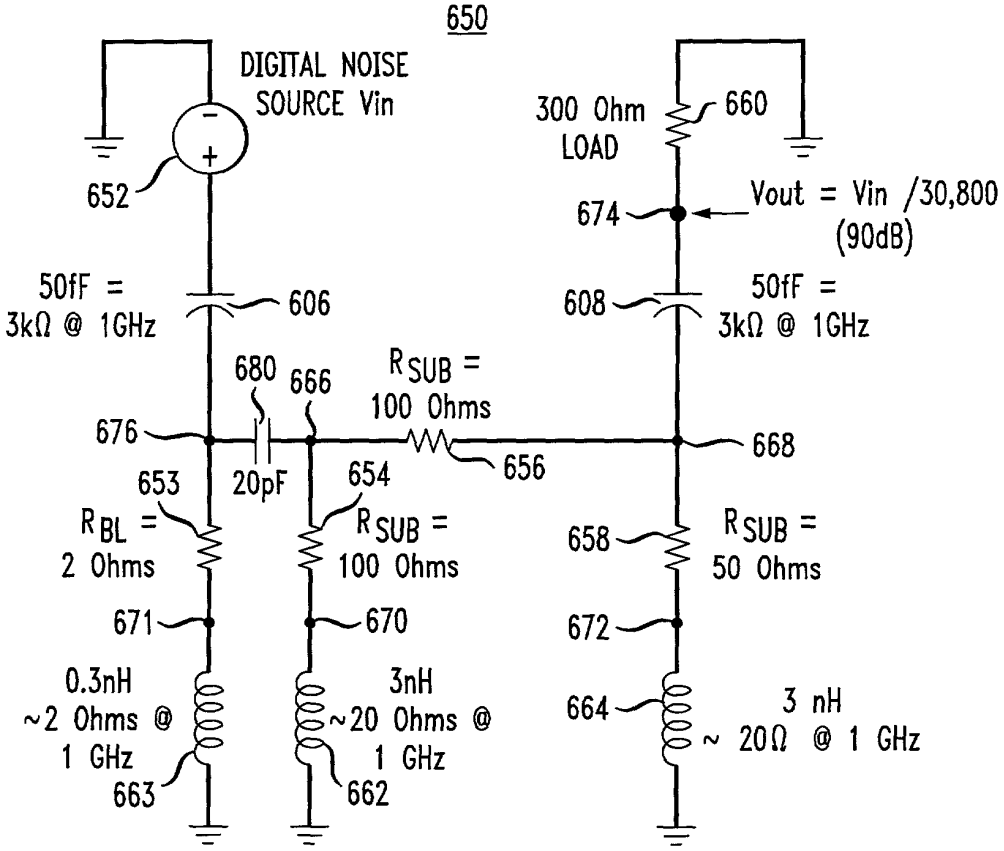

650
DIGITAL NOISE SOURCE Vin
652
50fF = 3kΩ @ 1GHz
606
680
666
RSUB = 100 Ohms
676
20pF
656
668
653
654
RBL = 2 Ohms
RSUB = 100 Ohms
671
670
0.3nH ~2 Ohms @ 1 GHz
663
3nH ~20 Ohms @ 1 GHz
662
300 Ohm LOAD
660
674
Vout = Vin /30,800 (90dB)
608
50fF = 3kΩ @ 1GHz
658
RSUB = 50 Ohms
672
664
3 nH ~ 20Ω @ 1 GHz

FIG. 7A

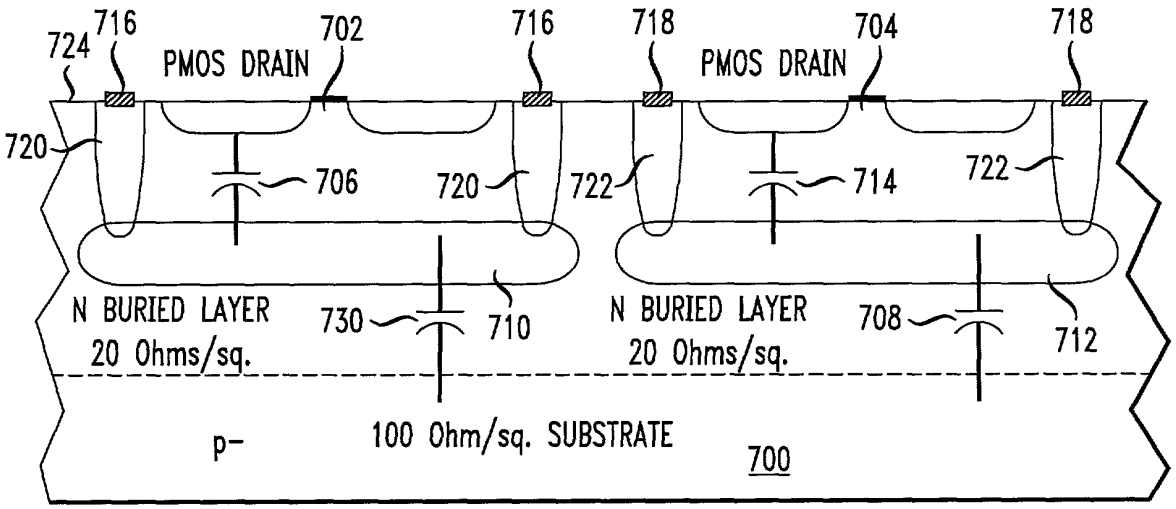
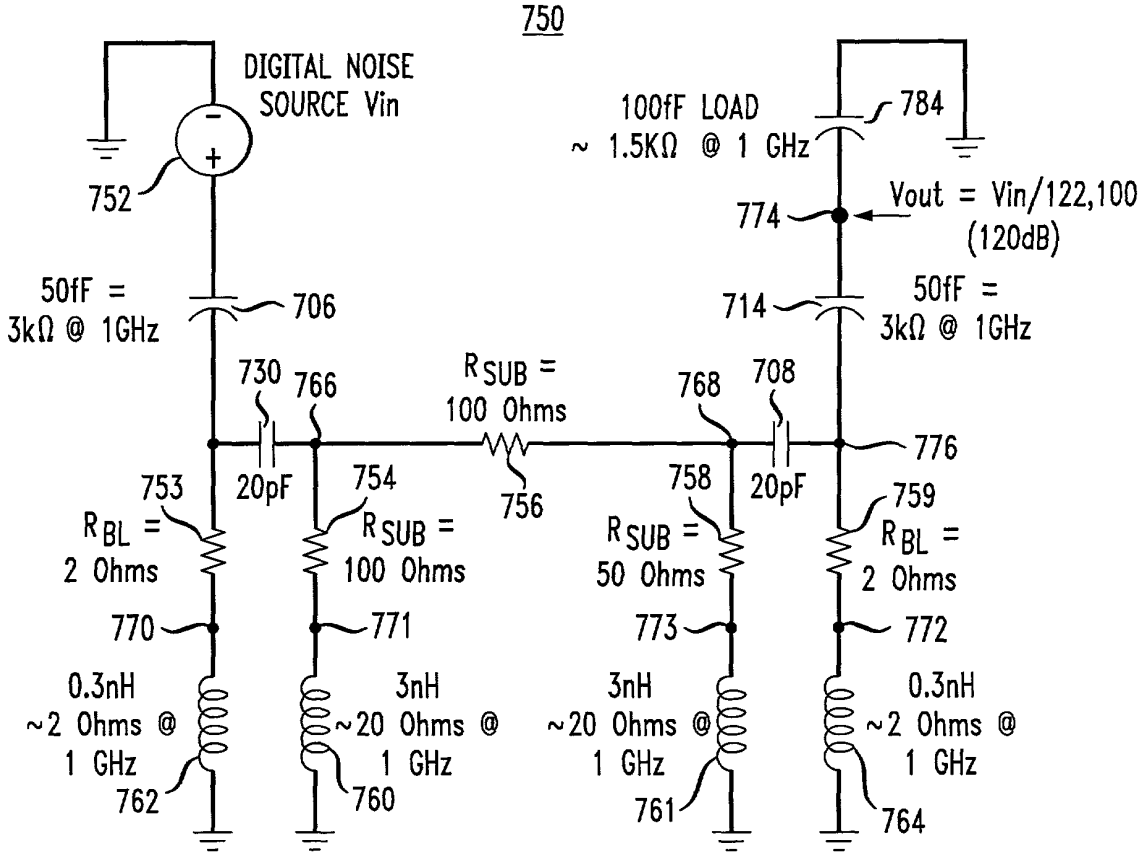

724
716
PMOS DRAIN
702
716
718
PMOS DRAIN
704
718
720
706
720
722
714
722
N BURIED LAYER
20 Ohms/sq.
730
710
N BURIED LAYER
20 Ohms/sq.
708
712
p-
100 Ohm/sq. SUBSTRATE
700

FIG. 7B


750
DIGITAL NOISE
SOURCE Vin
752
50fF =
3kΩ @ 1GHz
706
730
766
20pF
753
R BL =
2 Ohms
770
0.3nH
~2 Ohms @
1 GHz
762
754
R SUB =
100 Ohms
771
3nH
~20 Ohms @
1 GHz
760
R SUB =
100 Ohms
756
100fF LOAD
~ 1.5KΩ @ 1 GHz
784
774
Vout = Vin/122,100
(120dB)
714
50fF =
3kΩ @ 1GHz
768
708
20pF
758
R SUB =
50 Ohms
773
3nH
~20 Ohms @
1 GHz
761
776
759
R BL =
2 Ohms
772
0.3nH
~2 Ohms @
1 GHz
764